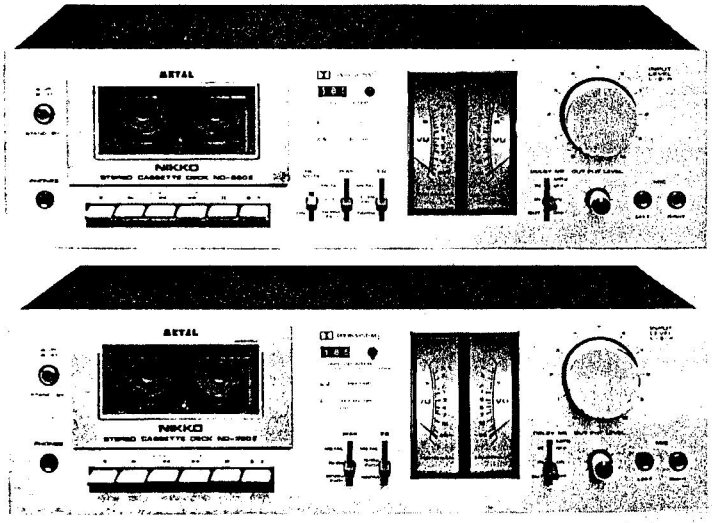
NIKKO DECK

ND-590II
ND-390II

STEREO CASSETTE DECK



TYPE AND VOLTAGE

ND-590II

W-TYPE: UL & CSA type	120V AC

ND-390II

E-TYPE: NK-STD type	220V AC
N-TYPE: DEMKO & SEMKO type	
D-TYPE: DIN type	
E-TYPE: BS type	240V AC

SERVICE MANUAL

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BLOCK DIAGRAM

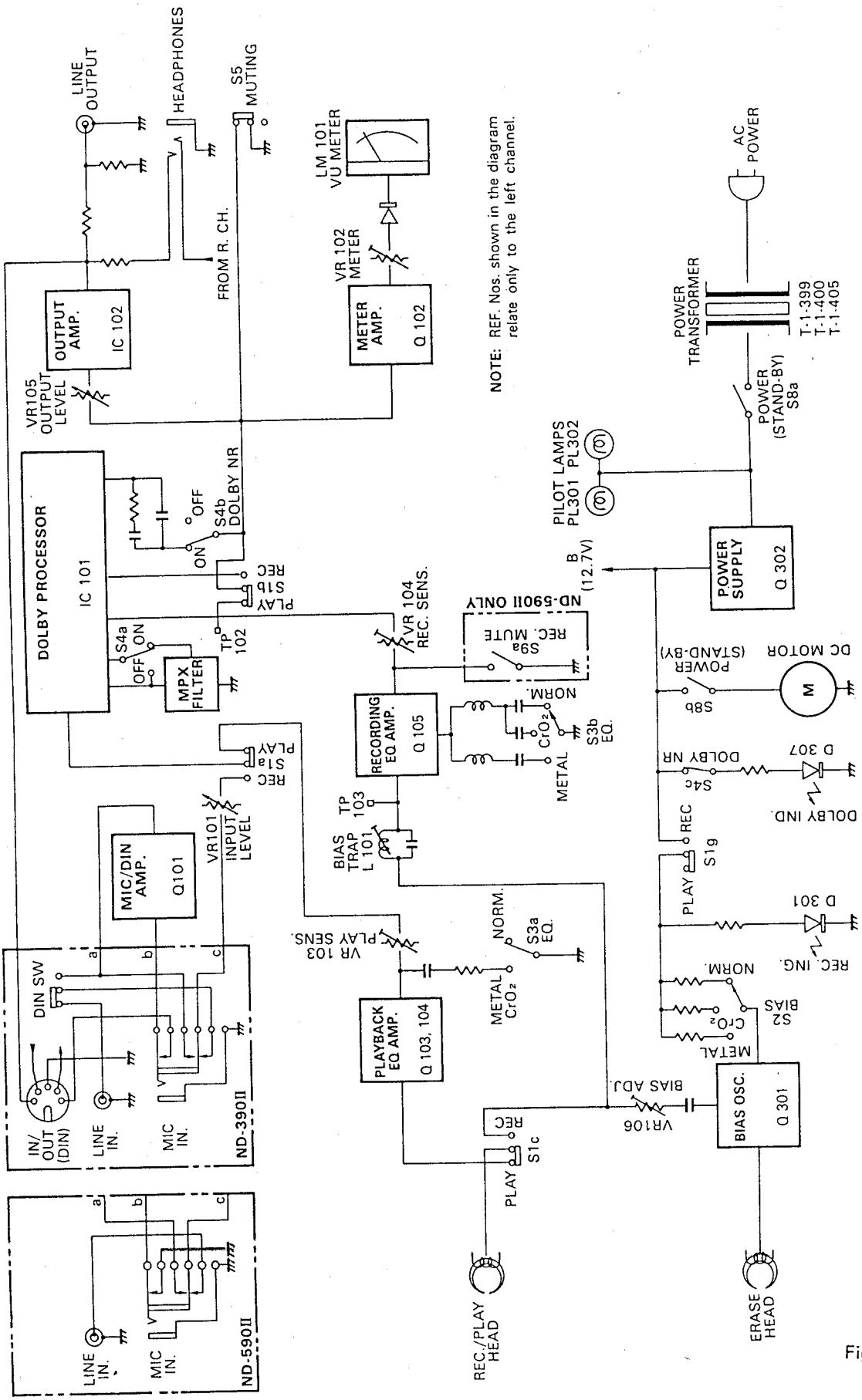


Figure 1

MECHANICAL PARTS LOCATION

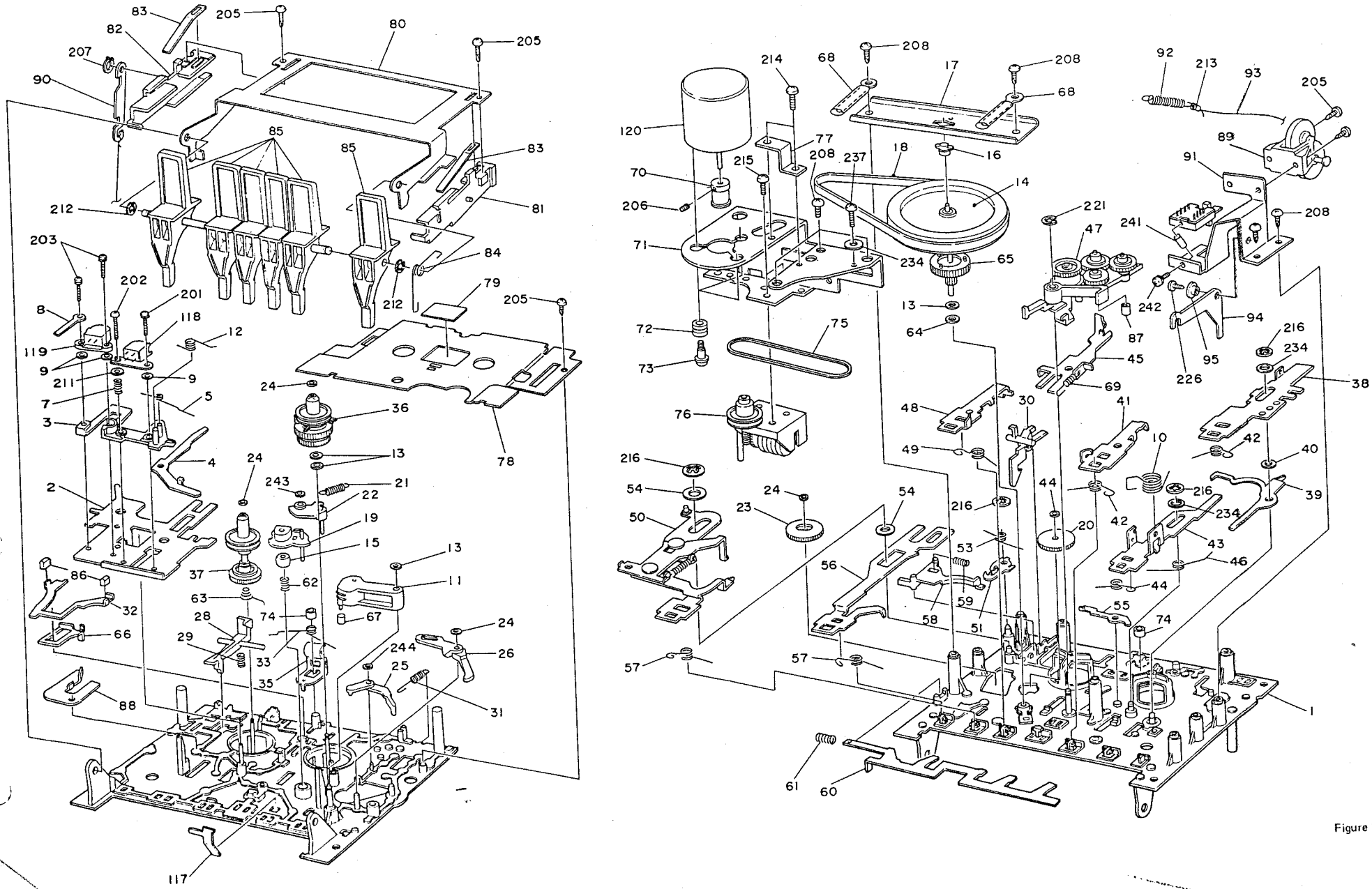


Figure 2

CABINET PARTS LOCATION

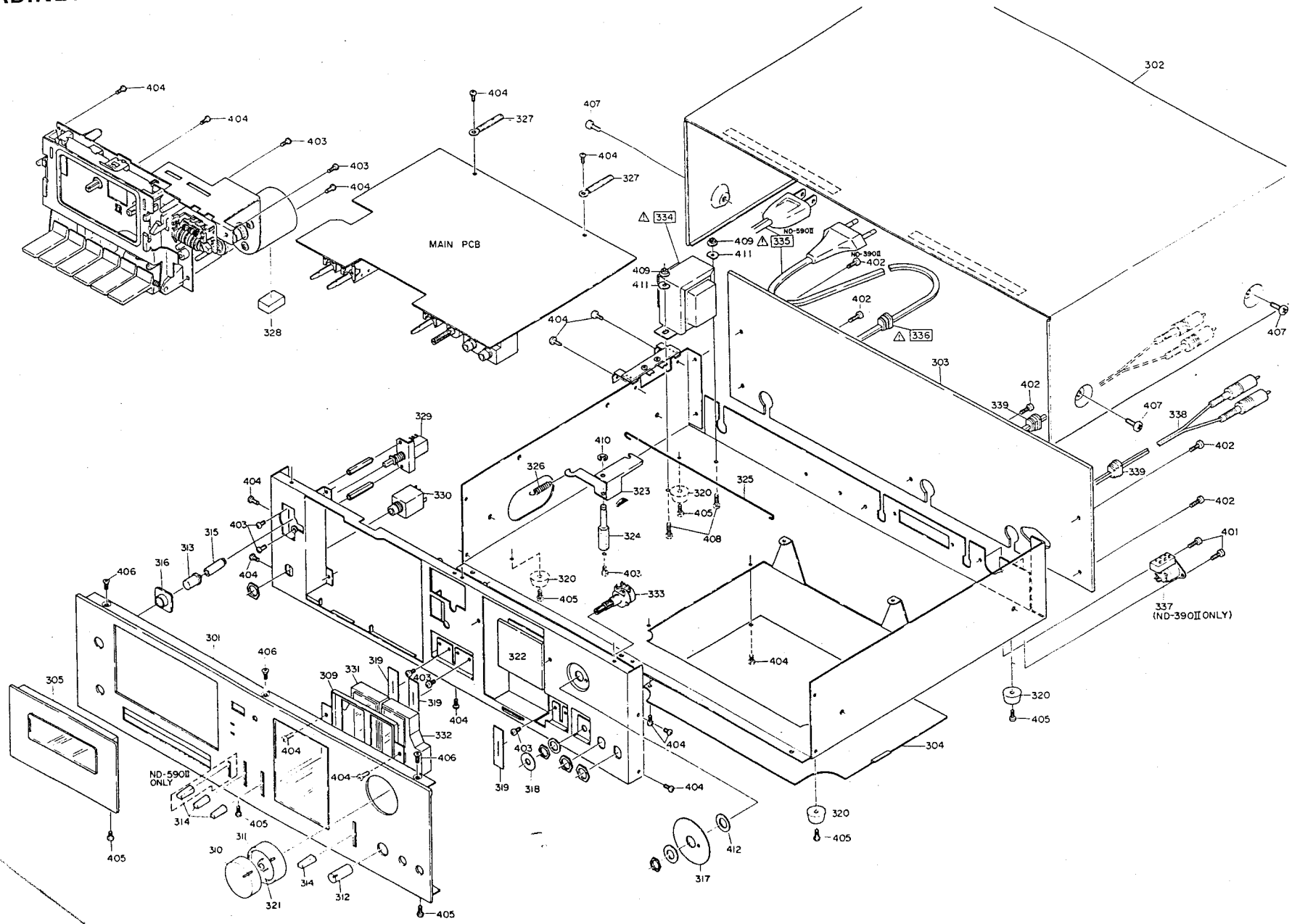


Figure 3

ALIGNMENT

TEST EQUIPMENT

Allow a minimum of 10 minutes warm-up for test equipment.
Maintain rated line voltage.

Audio Signal Generator
Vacuum Tube Voltmeter (VTVM)
Frequency Counter
Screwdriver
Resistance Attenuator (ATT)

Test Tapes

MTT–111	(3000 Hz)
MTT–114	(10 kHz)
MTT–150	(400 Hz)
AC–701	(TDK MA or MA-R)

ADJUSTMENT PARTS LOCATION

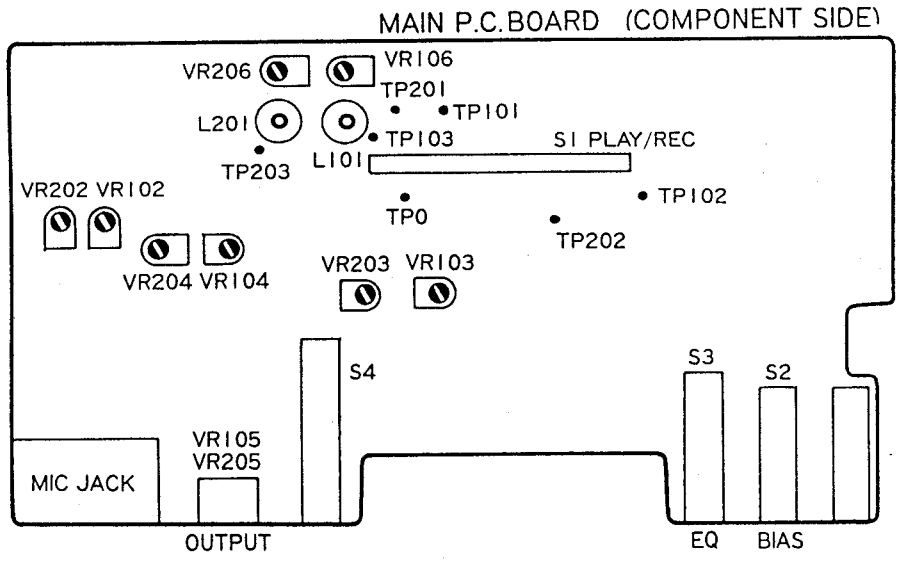


Figure 4

TAPE SPEED ADJUSTMENT

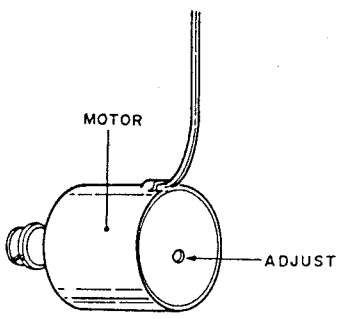


Figure 5

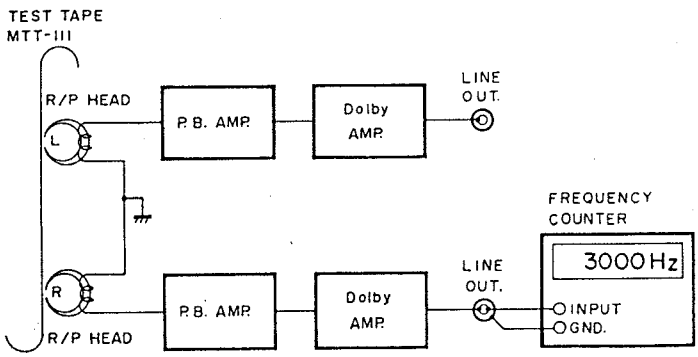


Figure 6

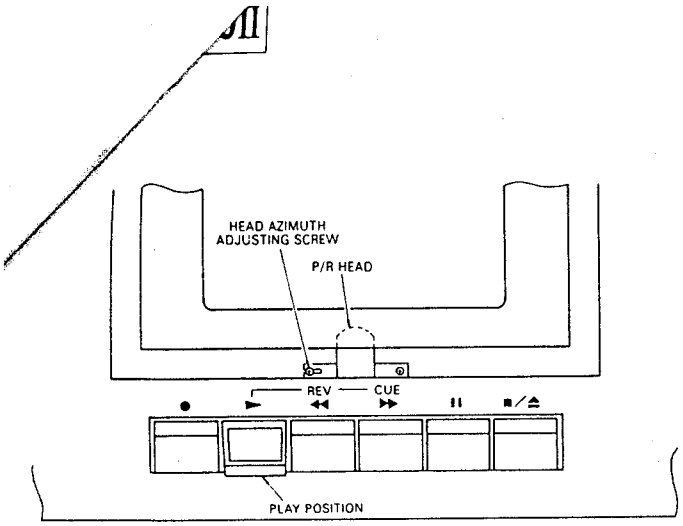


Figure 7

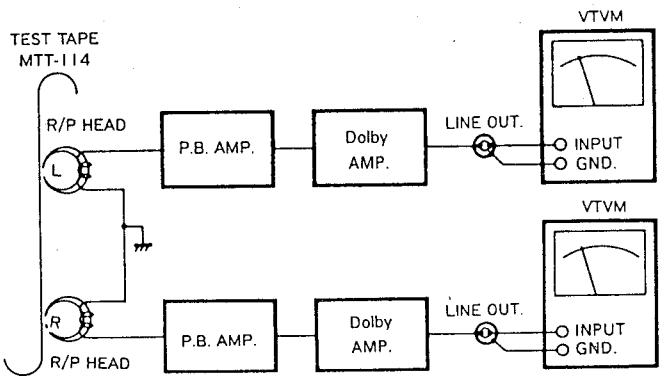


Figure 8

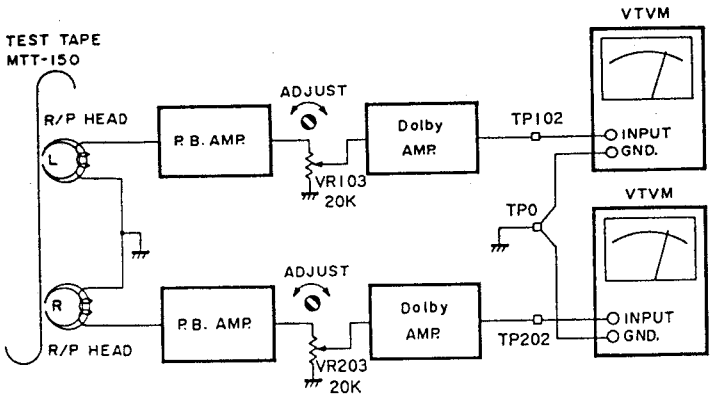


Figure 9

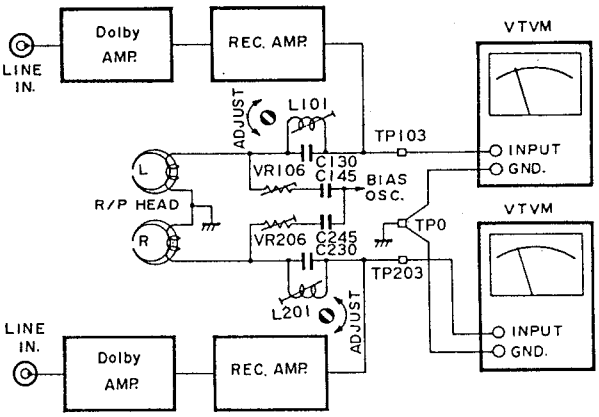


Figure 10

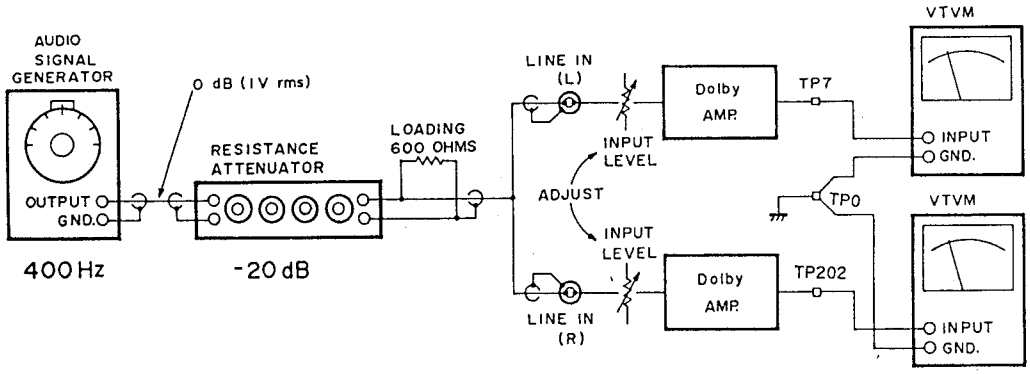


Figure 11

ADJUSTMENT PROCEDURE

Adjustment Items	Spec. Value	Test Tape	Deck Mode	Volume		Switch			Adjustment Parts	Test Points	Input (ATT)	Hook-up	Remarks
				INPUT	OUTPUT	BIAS	EQ	NR					
Tape Speed	3000±30Hz	MTT–111	Play	–	Max.	–	NORM	OUT	Semi-fixed Resistor (Figure 5)	Line Output	–	Figure 6	Frequency Counter indicates 3000±30Hz.
Head Azimuth Confirmation	Maximum	MTT–114	Play	–	Max.	–	NORM	OUT	Adjusting Screw (Figure 7)	Line Output	–	Figure 8	Maximum output level on VTVM. After adjusting, apply a locking paint to the adjusting screw.
Playback Sensitivity	580±10mV	MTT–150	Play	–	Max.	–	NORM	OUT	VR 103 VR 203	TP102 TP202	–	Figure 9	VTVM indicates 580±10mV.
Level Meter	Meter Ind. + 3dB	MTT–150	Play	–	Max.	–	NORM	OUT	VR 102 VR 202	Level Meter	–	–	Level Meter indicates +3dB.
Bias Leak	Minimum	AC–701	Record Pause	–	Max.	METAL	–	OUT	L 101 L 201	TP103 TP203	–	Figure 10	VTVM indicates minimum.
Line Input	580±10mV	AC–701	Record Pause	Adjust.	Max.	METAL	METAL	OUT	INPUT Volume	TP102 TP202	400Hz –20dB	Figure 11	VTVM indicates 580±10mV After adjusting, fix the INPUT volume.
REC/PLAY Frequency Characteristics	$0\ ^{+0}_{-2}$ dB	AC–701	Record & Play	Adjust.	Max.	METAL	METAL	OUT	VR 106 VR 206	Line Output	400Hz/ 10kHz –43dB	Figure 12	Difference between 400Hz and 10kHz output is keep within 0dB (+0, –2dB) on VTVM.
REC/PLAY Sensitivity	Monitor Output	AC–701	Record & Play	Adjust.	Max.	METAL	METAL	OUT	VR 104 VR 204	Line Output	400Hz –23dB	Figure 13	VTVM indicates 570mV (Referencevalue).

*Test Conditions: Input: 0dB (1Vrms)
Line input impedance: 600ohms
Line output load impedance: 50kohms
Test point load impedance: non-load

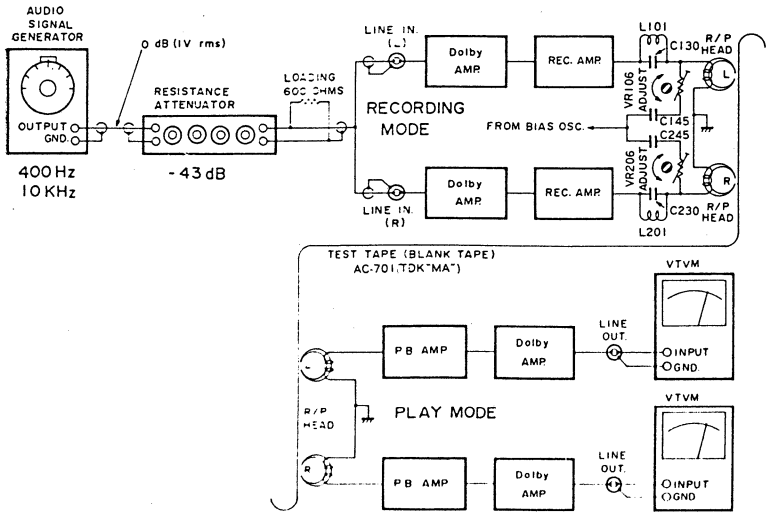


Figure 12

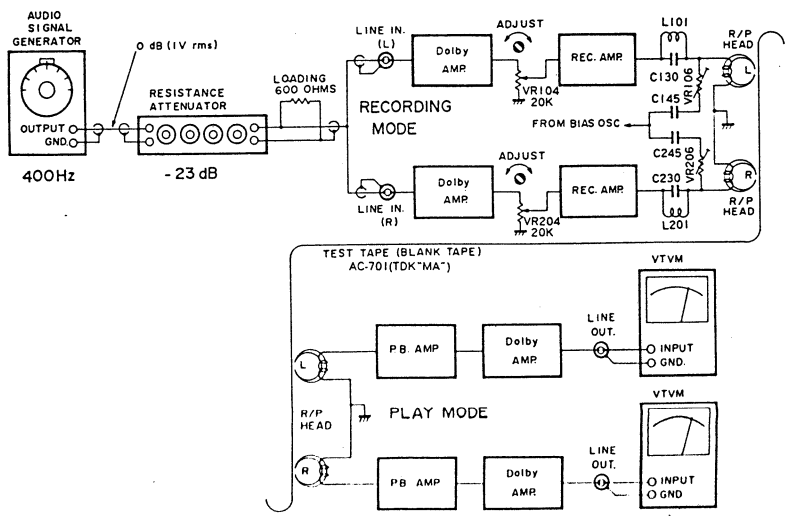
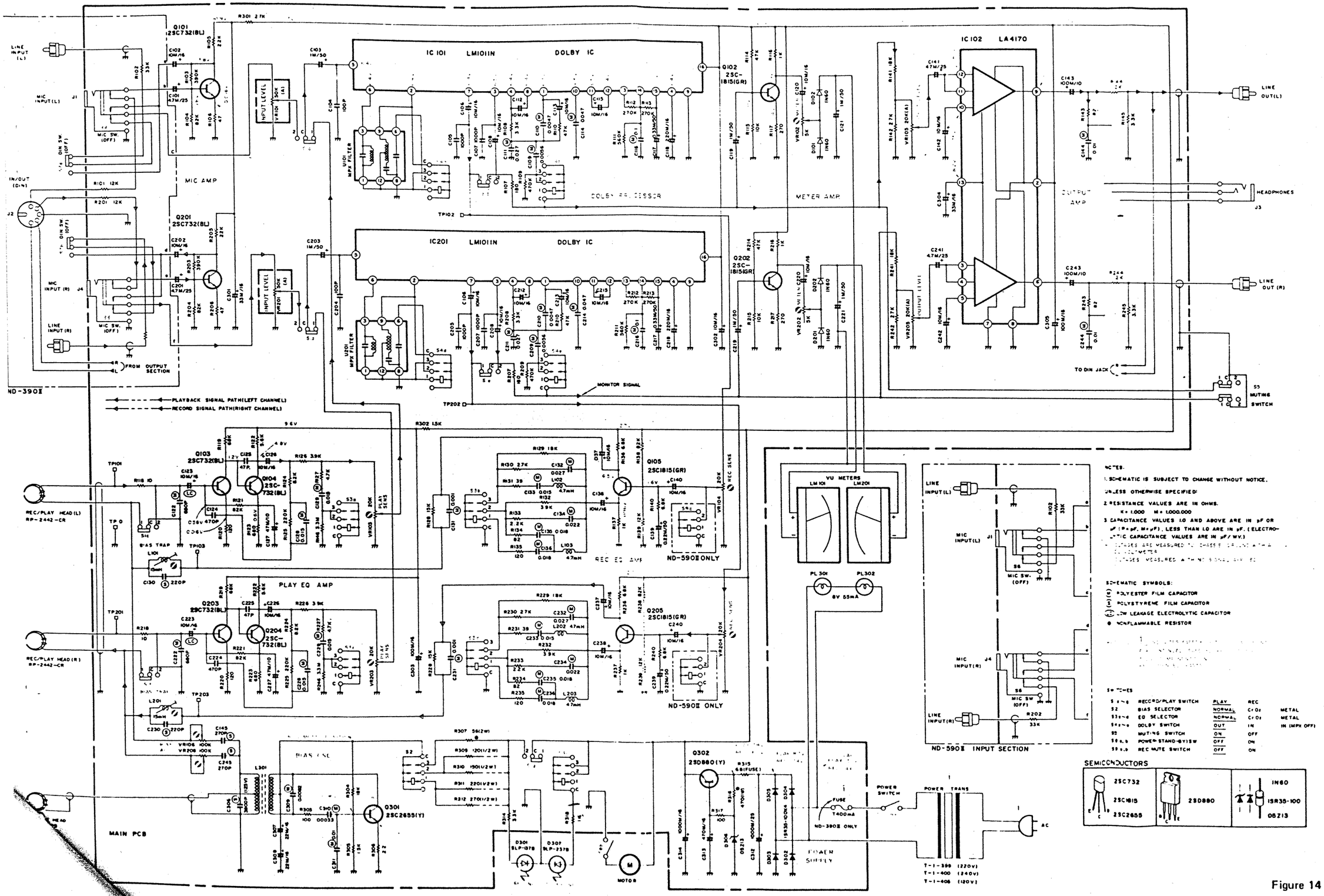


Figure 13

SCHEMATIC DIAGRAM



NOTES:

1. SCHEMATIC IS SUBJECT TO CHANGE WITHOUT NOTICE.
UNLESS OTHERWISE SPECIFIED:
2. RESISTANCE VALUES ARE IN OHMS.
K=1,000 M=1,000,000
3. CAPACITANCE VALUES 1.0 AND ABOVE ARE IN pF OR μF (P=pF, M=μF), LESS THAN 1.0 ARE IN μF. (ELECTROLYTIC CAPACITANCE VALUES ARE IN μF/WV.)
4. VOLTAGES ARE MEASURED TO CHASSIS OR LINE WITH A VOLTMETER.
VOLTAGES MEASURED WITH NO SIGNAL AND PB

SCHEMATIC SYMBOLS:
- POLYESTER FILM CAPACITOR
- POLYSTYRENE FILM CAPACITOR
- LOW LEAKAGE ELECTROLYTIC CAPACITOR
- NONFLAMMABLE RESISTOR

SWITCHES

		PLAY	REC	
S1 a-b	RECORD/PLAY SWITCH			
S2	BIAS SELECTOR	NORMAL	CrO2	METAL
S3 a-b	EQ SELECTOR	NORMAL	CrO2	METAL
S4 a-b	DOLBY SWITCH	OUT	IN	IN (MPX OFF)
S5	MUTING SWITCH	ON	OFF	
S6 a,b	POWER STAND-BY SW	OFF	ON	
S7 a,b	REC MUTE SWITCH	OFF	ON	

SEMICONDUCTORS

Figure 14

P.C.BOARD (CONDUCTIVE SIDE VIEW)

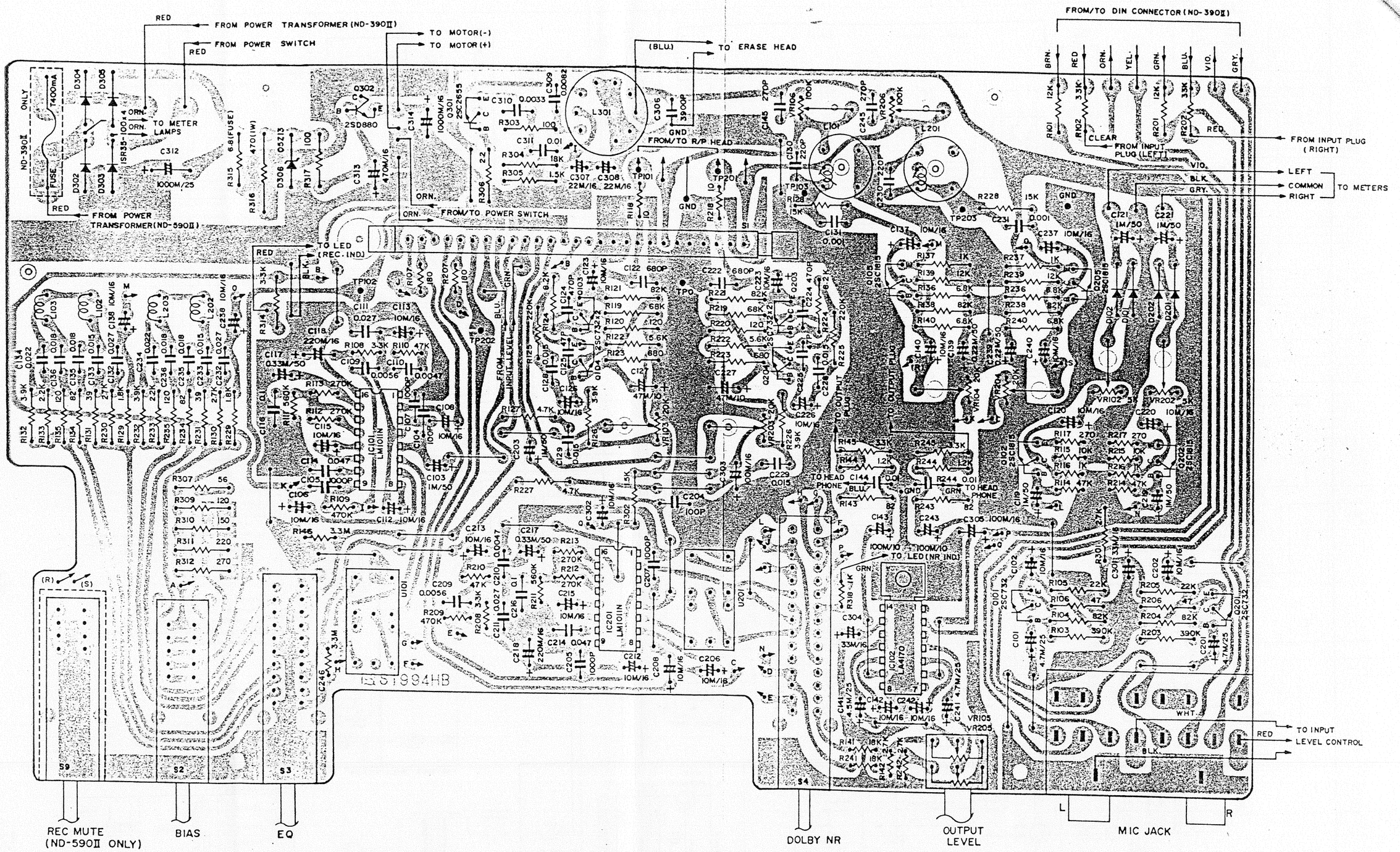


Figure 15

PARTS LIST

TES:

* The KEY NUMBER (#) on parts list relate to number in "MECHANICAL PARTS LOCATION" and "CABINET PARTS LOCATION".

\+ Numberals in file indicate the quantity of parts used in one type.
W- TYPE: ND-5901I (120V AC)
E, N & D - TYPE: ND-3901I (220 or 240V AC)

++ TR : Transistor
FET : Field effect transistor
VR : Volume control (Variable resistor)
RES : Carbon film fixed resistor
MO-RES : Metal oxide film fixed resistor
CEM-RES : Cemented wirewound fixed resistor
FP : Flame proof
C-CAP : Ceramic capacitor
E-CAP : Aluminum electrolytic capacitor
M-CAP : Polyester film capacitor
S-CAP : Polystyrene film capacitor
T-CAP : Tantalum electrolytic capacitor
LC-CAP : Low current leakage electrolytic capacitor..

4. Assemblies and parts are subject to change without notice.

5.

A. DO NOT USE THE "KEY" NUMBER AND "SYMBOL" NUMBER. (these are control # for the factory only)

B. Include in any order

a. Part number.
b. Part description.
c. Model number.

(any of the above lacking from an order may delay shipment of that order.)

CAUTION:

The ⚠ mark, the KEY NO. and the SYMBOL NO. circled with rectangle in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list.

PART ORDERING PROCEDURE ----- DO NOT USE THE "KEY" NUMBER AND "SYMBOL" NUMBER. (these are control # for the factory only.) Include in any order: a. Part number, b. Part description, c. Model number. (any of the above lacking from an order may delay shipment of the order.)

KEY NO.	SYMBOL NO.	TYPE+ WEND	DESCRIPTION	PART NO.
			CASSETTE MECHANISM ASSEMBLY	
1		1111	CASSETTE MECHANISM ASSEMBLY	9260130
3		1111	Stand, head	7402800
4		1111	Lever, automatic release	7402810
5		1111	Spring, automatic release	7440800
7		1111	Spring, R/P head	7440810
9		3333	Washer, head	7050590
10		1111	Spring, head chassis	7440820
11		1111	Pinch roller assembly	7903330
12		1111	Spring, pinch roller	7440830
13		4444	Washer, PO – 2.6 x 7 x 0.25	7002540
14		1111	Flywheel	7490270
15		1111	Bearing, flywheel	7152510
16		1111	Bearing, flywheel -- (B)	7402820
18		1111	Belt, flywheel	7903340
19		1111	Arm, P-gear – (B)	7402830
20		1111	P-gear	7402850
21		1111	Spring, P-gear – (A)	7440840
22		1111	Arm, gear	7402840
23		1111	Gear	7402860
24		5555	Washer, PO – 1.6 x 4 x 0.25	7002550
25		1111	Arm, automatic stop	7402870
26		1111	Arm, kick	7402880
28		1111	Arm, record prevention	7402890
29		1111	Spring, record prevention	7440850
30		1111	Arm, door lock	7402900
31		1111	Spring, door lock	7440860
32		1111	Arm, break	7033610
33		1111	Spring, break arm	7440870
35		1111	Spring, cassette push	7450170
36		1111	Take-up reel assembly	957013P
37		1111	Supply reel assembly	957014P
38		1111	Lever, record	7033620
39		1111	Lock plate, record – (D)	7033630
40		1111	Washer, PO – 5.2 x 12 x 0.25	7002560
41		1111	Arm, rewind	7033640
42		2222	Spring, rewond arm	7440880
43		1111	Lever assembly, play	7033650
44		1111	Spring, play lever – (E)	7440890
45		1111	Plate, switch – (D)	7033660
46		1111	Spring, switch plate – (B)	7440900
		1111	Center gear assembly	957015P
		1111	Arm, FF	7033670
		1111	Spring, FF arm	7440910
		1111	Lever assembly, pause	7033680
		1111	Lever, pause – (B)	7033690
		1111	Spring, pause lever (B)	7440920

KEY NO.	SYMBOL NO.	TYPE+ WEND	DESCRIPTION	PART NO.
54		2222	Washer, PO – 5.1 x 10 x 0.2	7002570
55		1111	Arm, review – (C)	7033700
56		1111	Lever, stop	7033710
57		1111	Spring, stop lever	7440930
58		1111	Lever, eject – (A)	7402910
59		1111	Spring, eject lever (A)	7440940
60		1111	Plate, lock – (N)	7033720
61		1111	Spring, lock plate -- (N)	7440950
62		1111	Spring, P-gear – (B)	7440960
63		1111	Spring, back tension	7440970
65		1111	Gear, flywheel – (A)	7402920
66		1111	Plate, switching – (C)	7033730
69		1111	Spring, center gear	7440980
70		1111	Pulley, motor	7152520
72		3333	Cushion, motor	7903350
73		3333	Screw, motor	7121370
75		1111	Belt, counter	7903360
76		1111	Counter, tape	7903370
78		1111	Cover, mechanism	7802720
79		1111	Plate, reflection	7903380
80		1111	Holder, cassette	7802730
81		1111	Guide, cassette – (A)	7402930
82		1111	Guide, cassette – (B)	7402940
83		2222	Spring, cassette hold	7450180
84		1111	Spring, eject	7440990
85a		6666	Button, operation – SILVER	7852450
85b		6666	Button, operation – BLACK	7852460
86		2222	Brake, rubber	7903390
89		1111	Damper assembly, eject	957016P
92		1111	Spring, damper	7440100
117		1111	Lever, pause – (D)	7033740
118		1111	Head, record playback -- RP-2442-CR	1400070
119		1111	Head, erase – E-921-PS	1400080
120		1111	Motor assembly	9200010
201		1111	Screw – W/SW 2ox10	7121330
202		1111	Screw – RMS 2ox10	8211105
203		2222	Screw – W/SW 2ox12	7121340
205		5555	Screw – PTS 2.6ox6, black	813206W
206		1111	Screw, set – 2.6ox5	800205S
207		1111	G-ring – 4o	7033580
208		7777	Screw – BTS 3ox8	854308S
211		1111	Washer – 2o	893101G
212		2222	E-ring – 4o	7033220
213		1111	Eyelet – 2ox3	890130B

KEY NO.	SYMBOL NO.	TYPE+ WEND	DESCRIPTION	PART NO.
214		2222	Screw – BFTS 3ox6	857306S
215		2222	Screw – PMS 3ox6	810306S
216		4444	CS-ring – 4o	7033250
221		1111	E-ring – 2.5o	7033590
226		1111	Screw – BFTS 3ox8	857308S
234		3333	Washer – 4o	893104S
237		1111	Screw – BFTS 3ox10	857310S
241		1111	Pipe – 2.6ox6	7121360
242		1111	Screw – W SW 2.6ox10	7121350
243		1111	E-ring – 1.5o	7033100
244		1111	E-ring – 1.2o	7033600
			CABINET ASSEMBLY	
301a		1---	Panel, front – ND-5901I, SILVER	7885170
301b		1---	Panel, front – ND-5901I, BLACK	7885180
301c		-111	Panel, front – ND-3901I, SILVER	7885070
301d		-111	Panel, front – ND-3901I, BLACK	7885080
302		1111	Cover, top	7821100
303a		1---	Plate, back – ND-5901I	7326540
303b		-111	Plate, back – ND-3901I	7326440
303c		-1--	Plate, back – ND-3901I, England only	7326450
304		1111	Plate, bottom	7326460
305a		1---	Cassette cover assembly – ND-5901I, SILVER	7870560
305b		1---	Cassette cover assembly – ND-5901I, BLACK	7870570
305c		-111	Cassette cover assembly – ND-3901I, SILVER	957011P
305d		-111	Cassette cover assembly – ND-3901I, BLACK	957012P
309		1111	Panel, meter	7870510
310a		1111	Knob, input level – left, SILVER	7841400
310b		1111	Knob, input level – left, BLACK	7841410
311a		1111	Knob, input level – right, SILVER	7841420
311b		1111	Knob, input level – right, BLACK	7841430
312a		1111	Knob, output level – SILVER	7852250
312b		1111	Knob, output level – BLACK	7852260
313a		1111	Button, push – power, SILVER	7852270
313b		1111	Button, push – power, BLACK	7852280
314		4333	Knob, lever – EQ, bias, Dolby NR, (rec mute)	7851820
315		1111	Shaft, extension – 26.5	7401730
316		1111	Guide, push button	7401260
317		1111	Dust cover -- (A)	7402770
318		1111	Dust cover -- (B)	7903310
319		4333	Dust cover – (C)	7002520
320		4444	Foot, polyethylen	7402790
321		1111	Washer – PO	7002510
322		1111	Cushion, meter	7903320
323		1111	Lever, record	7033570
324		1111	Shaft, record	7121300
325		1111	Rod, record	7440780
326		1111	Spring, record	7440790
329		1111	Switch, push – power	4041560
330		1111	Jack, headphones	4550310
331		1111	Meter, VU – left	4582740
332		1111	Meter, VU – right	4582750
333		1111	VR 50kohm x 2 -- input level	4321110
334a		1---	Transformer, power – T-1-405 – 120V	1104050
334b		-111	Transformer, power – T-1-399 – 220V	1103990
334c		-1--	Transformer, power – T-1-400 – 240V	1104000
335a		1---	Cord, power – DP-70	606007A
335b		-111	Cord, power – CEE-2T	600510A
335c		-1--	Cord, power – BS, England only	600513A
336a		1---	Bush, power cord – SR-3P-4	7400620
336b		-111	Bush, power cord – SR-4N-4	7400690
337		-111	Connector, DIN type 5P	4530570
338		2222	Cord, RCA phono pin plug – 2P	962019J
339		2222	Bush, cord – SR-3P-4	7400620
401		-222	Screw – BFTS 3ox6, black	857306W
402		4444	Screw – BFTS 4ox8, black	857308W
403		2222	Screw – W SW 3ox6	7121310
404		1010IC	Screw – BFTS 3ox6	857306S
405		3333	Screw – BFTS 3ox8	857308S
406		3333	Screw – FFTS 3ox5	837305S
407		4444	Screw – BMS 4ox8, black	850408W
408		2222	Screw – BMS 4ox10	850410S
409		2222	Nut – W/flange 4o	7121140
410		1111	E-ring – 4o	7033220
411		2222	Washer, power transformer	7033560
			MAIN PC BOARD ASSEMBLY	
		1---	MAIN PCB ASSEMBLY – ND-5901I	9441680
		-111	MAIN PCB ASSEMBLY – ND-3901I	9441630
VR105		1111	VR 20kohm x 2 – output level	4321120
S1		1111	Switch, slide – record/playback	4020690
S2		1111	Switch, lever – bias	4025540
S3		1111	Switch, lever – EQ	4025530
S4		1111	Switch, lever – Dolby NR	4025520
S5		1---	Switch, lever – rec mute	4025560
J1		1111	Jack, microphone – 2P	4550320
		-111	Midget fuse – T400mA 250V	4720480
		-222	Clip, midget fuse	7050580
L101,201		2222	Coil, bias trap – 15mH	1500040
L102,103, L202,203		4444	Coil, record equalizing – 4.7mH	1600020
L301		1111	Coil, bias oscillator	1500030
U101,201		2222	Filter, Dolby NR	1260160
IC101,201		2222	IC LM1011N	518108S
IC301		1111	IC LA4170	518089S
Q101,201		2222	TR 2SC732 (BL)	515086S
Q102,202		2222	TR 2SC1815 (GR)	512107S
Q103,104, Q203,204		4444	TR 2SC732 (BL)	515086S
Q105,205		2222	TR 2SC1815 (GR)	512107S
Q301		1111	TR 2SC2655 (Y)	512124S
Q302		1111	TR 2SD880 (Y)	513106S
D101,102, D201,202		4444	Diode 1N60	500001G
D302 ~ D305		4444	Diode 1SR35-100	560067S
D306		1111	Zener diode 05Z13L	502075S
D301		1111	LED SLP137B – red – record indicator	5060130
D307		1111	LED SLP237B -- green – Dolby NR indicator	5060140
C101,201		2222	E CAP 4.7uf 25V	211315Q
C102,202		2222	E CAP 10uf 16V	211220Q
C103,203		2222	E CAP 1uf 50V	211510Q

PART ORDERING PROCEDURE ----- DO NOT USE THE "KEY" NUMBER AND "SYMBOL" NUMBER. (these are control # for the factory only.) Include in any order: a. Part number, b. Part description, c. Model number. (any of the above lacking from an order may delay shipment of the order.)

KEY NO.	SYMBOL NO.	TYPE+ WEND	DESCRIPTION	PART NO.
	C104,204	2222	C-CAP 100pf 10% 50V	232101K
	C105,205	2222	C-CAP 1000pf 10% 50V	231102K
	C106,206	2222	E-CAP 10uf 16V	211220Q
	C107,207	2222	C-CAP 1000pf 10% 50V	231102K
	C108,208	2222	E-CAP 10uf 16V	211220Q
	C109,209	2222	M-CAP 0.0056uf 5% 50V	222562J
	C110,210	2222	M-CAP 0.0047uf 5% 50V	222472J
	C111,211	2222	M-CAP 0.027uf 5% 50V	222273J
	C112,212	2222	E-CAP 10uf 16V	211220Q
	C113,213	2222	E-CAP 10uf 16V	211220Q
	C114,214	2222	M-CAP 0.047uf 5% 50V	222473J
	C115,215	2222	E-CAP 10uf 16V	211220Q
	C116,216	2222	M-CAP 0.1uf 5% 50V	222104J
	C117,217	2222	E-CAP 0.33uf 20% 50V	211503Q
	C118,218	2222	E-CAP 220uf 16V	211232Q
	C119,219	2222	E-CAP 1uf 50V	211510Q
	C120,220	2222	E-CAP 10uf 16V	211220Q
	C121,221	2222	E-CAP 1uf 50V	211510Q
	C122,222	2222	M-CAP 680pf 5% 50V	222681J
	C123,223	2222	LC-CAP 10uf 16V	211220L
	C124,224	2222	C-CAP 470pf 10% 50V	232471K
	C125,225	2222	C-CAP 47pf 10% 50V	232470K
	C126,226	2222	E-CAP 10uf 16V	211220Q
	C127,227	2222	E-CAP 47uf 10V	211125Q
	C128,228	2222	M-CAP 0.015uf 10% 50V	222153J
	C129,229	2222	M-CAP 0.015uf 10% 50V	222153J
	C130,230	2222	S-CAP 220pf 5% 50V	223221J
	C131,231	2222	M-CAP 0.001uf 5% 50V	222102J
	C132,232	2222	M-CAP 0.027uf 5% 50V	222273J
	C133,233	2222	M-CAP 0.015uf 5% 50V	222153J
	C134,234	2222	M-CAP 0.022uf 5% 50V	222223J
	C135,235	2222	M-CAP 0.018ur 5% 50V	222183J
	C136,236	2222	M-CAP 0.018uf 5% 50V	222183J
	C137,237	2222	E-CAP 10uf 16V	211220Q
	C138,238	2222	E-CAP 10uf 16V	211220Q
	C139,239	2222	E-CAP 0.22uf 20% 50V	211502Q
	C140,240	2222	E-CAP 10uf 16V	211220Q
	C141,241	2222	E-CAP 4.7uf 25V	211315Q
	C142,242	2222	E-CAP 10uf 16V	211220Q
	C143,243	2222	E-CAP 100uf 10V	211130Q
	C144,244	2222	M-CAP 0.01uf 5% 50V	222103J
	C145,245	2222	S-CAP 270pf 5% 50V	223271J
	C301	1111	E-CAP 33uf 16V	211223Q
	C302	1111	E-CAP 10uf 16V	211220Q
	C303	1111	E-CAP 100uf 16V	211230Q
	C304	1111	E-CAP 33uf 16V	211223Q
	C305	1111	E-CAP 100uf 16V	211230Q
	C306	1111	S-CAP 3900pf 5% 125V	272392J
	C307,308	2222	E-CAP 22uf 16V	211222Q
	C309,310	2222	M-CAP 0.0082uf 5% 50V	222822J
	C311	1111	M-CAP 0.01uf 5% 50V	222103J
	C312	1111	E-CAP 1000uf 25V	211340Q
	C313	1111	E-CAP 470uf 16V	211235Q
	C314	1111	E-CAP 1000uf 16V	211240Q
	VR102,202 VR103,104,	2222	Potentiometer 5kohm	4301370
	VR203,204	4444	Potentiometer 20kohm	4301380
	VR106,206	2222	Potentiometer 100kohm	4301390
	R101,201	2222	RES 12kohm 5% ¼W	328123J
	R102,202	2222	RES 33kohm 5% ¼W	328333J
	R103,203	2222	RES 390kohm 5% ¼W	328394J
	R104,204	2222	RES 82kohm 5% ¼W	328823J
	R105,205	2222	RES 22kohm 5% ¼W	328223J
	R106,206	2222	RES 47ohm 5% ¼W	328470J
	R107,207	2222	RES 180ohm 5% ¼W	324181V
	R108,208	2222	RES 3.3kohm 5% ¼W	324332V
	R109,209	2222	RES 470kohm 5% ¼W	324474V
	R110,210	2222	RES 47kohm 5% ¼W	324473V
	R111,211	2222	RES 560kohm 5% ¼W	324564V
	R112,212	2222	RES 270kohm 5% ¼W	324274V

KEY NO.	SYMBOL NO.	TYPE+ WEND	DESCRIPTION	PART NO.
	R113,213	2222	RES 270kohm 5% ¼W	324274V
	R114,214	2222	RES 47kohm 5% ¼W	324473V
	R115,215	2222	RES 10kohm 5% ¼W	324103V
	R116,216	2222	RES 1kohm 5% ¼W	324102V
	R117,217	2222	RES 270ohm 5% ¼W	324271V
	R118,218	2222	RES 10ohm 5% ¼W	324100V
	R119,219	2222	RES 68kohm 5% ¼W	328683J
	R120,220	2222	RES 120ohm 5% ¼W	328121J
	R121,221	2222	RES 82kohm 5% ¼W	328823J
	R122,222	2222	RES 5.6kohm 5% ¼W	328562J
	R123,223	2222	RES 680ohm 5% ¼W	328681J
	R124,224	2222	RES 8.2kohm 5% ¼W	328822J
	R125,225	2222	RES 220kohm 5% ¼W	328224J
	R126,226	2222	RES 3.9kohm 5% ¼W	328392J
	R127,227	2222	RES 4.7kohm 5% ¼W	328472J
	R128,228	2222	RES 15kohm 5% ¼W	328153J
	R129,229	2222	RES 1.8kohm 5% ¼W	328182J
	R130,230	2222	RES 2.7kohm 5% ¼W	328272J
	R131,231	2222	RES 39ohm 5% ¼W	328390J
	R132,232	2222	RES 3.9kohm 5% ¼W	328392J
	R133,233	2222	RES 2.2kohm 5% ¼W	328222J
	R134,234	2222	RES 82ohm 5% ¼W	328820J
	R135,235	2222	RES 120ohm 5% ¼W	328121J
	R136,236	2222	RES 6.8kohm 5% ¼W	328682J
	R137,237	2222	RES 1kohm 5% ¼W	328102J
	R138,238	2222	RES 82kohm 5% ¼W	328823J
	R139,239	2222	RES 12kohm 5% ¼W	328123J
	R140,240	2222	RES 6.8kohm 5% ¼W	328682J
	R141,241	2222	RES 18kohm 5% ¼W	324183V
	R142,242	2222	RES 2.7kohm 5% ¼W	324272V
	R143,243	2222	RES 82ohm 5% ¼W	328820J
	R144,244	2222	RES 1.2kohm 5% ¼W	328122J
	R145,245	2222	RES 3.3kohm 5% ¼W	328332J
	R146,246	2222	RES 3.3meg.ohm 5% ¼W	324335V
	R301	1111	RES 2.7kohm 5% ¼W	328272J
	R302	1111	RES 1.5kohm 5% ¼W	328152J
	R303	1111	RES 100ohm 5% ¼W	328101J
	R304	1111	RES 18kohm 5% ¼W	328183J
	R305	1111	RES 1.5kohm 5% ¼W	328152J
	R306	1111	RES 2.2ohm 5% ¼W	328228J
	R307	1111	FP-MO-RES 56ohm 5% 2W	362560B
	R308	1111	RES, solid 100ohm 10% ½W	315101K
	R309	1111	RES, solid 120ohm 10% ½W	315121K
	R310	1111	RES, solid 150ohm 10% ½W	315151K
	R311	1111	RES, solid 220ohm 10% ½W	315221K
	R312	1111	RES, solid 270ohm 10% ½W	315271K
	R313	1111	RES, solid 330ohm 10% ½W	315331K
	R314	1111	RES 3.3kohm 5% ¼W	328332J
	R315	1111	RES, fusible 6.8ohm 5% ¼W	354688J
	R316	1111	FP-MO-RES 470ohm 5% 1W	361471B
	R317	1111	RES 100ohm 5% ¼W	328101J
	R318	1111	RES 1kohm 5% ¼W	324102V

PACKING MATERIALS & ACCESSORIES

1	---	Carton box, ND-590II	9825820
-1	11	Carton box, ND-390II	9825800
1	111	Pad – left	9840980
1	111	Pad – right	9840990
1	111	Sack, polyethylen cloth	9640810
1	---	Manual, instruction – ND-590II, English	960341E
1	---	Manual, instruction – ND-590II, French	960341F
-1	11	Manual, instruction – ND-390II, English	960329E
-1	11	Manual, instruction – ND-390II, French	960329F
-1	11	Manual, instruction – ND-390II, German	960329G
-1	11	Manual, instruction – ND-390II, Spanish	960329S
-1	11	Manual, instruction – ND-390II, Italian	960329I
1	111	Sack, instruction manual	9640820
1	---	Card, warranty – U.S.A.	967010A
1	---	Card, warranty – Canada	9670420
1	---	List, service stations	9690180
1	---	Manual, safety instruction	9670410

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SEMICONDUCTOR DATA,

TRANSISTORS

† NOTES Ge: Germanium, Si: Sillicon

A: Alloy, B: Base, D: Diffused, Dd: Double-diffused

Df: Drift-field, E: Epitaxial, G: Grown, J: Junction

M: Mesa, P: Planer, Pc: Point-contact, Td: Triple-diffused

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (T_A = 25°C unless otherwise specified)					ELECTRICAL CHARACTERISTICS Typical Values: (T_A = 25°C unless otherwise specified)													MANUFACTURER
			Collector-to-Base Voltage V_{CBO} (V)	Emitter-to-Base Voltage V_{EBO} (V)	Collector Current I_C (mA)	Collector Dissipation P_C (mW)	Junction Temperature T_J (°C)	Collector Cutoff Current I_{CBO} (uA)	Collector Cutoff Current V_{CB} (V)	Static Forward-Current Transfer Ratio h_{FE}	Static Forward-Current Transfer Ratio V_{CE} (V)	Static Forward-Current Transfer Ratio I_C (mA)	Collector-Emitter Saturation Voltage $V_{CE(sat)}$ (V)	Collector-Emitter Saturation Voltage I_C (mA)	Collector-Emitter Saturation Voltage I_B (mA)	Gain-Bandwidth Product f_T (MHz)*	Gain-Bandwidth Product V_{CB}* (V)	Gain-Bandwidth Product I_E I_C* (mA)	Output Capacitance Cob (pF)	Others	
2SC732 (BL)	AF, Low noise	NPN Si-E	35	5	100	200	125	0.1 max.	18	350 ~ 700	6	2	0.3 max.	10	1	80	6	-1	10 max.		TOSHIBA
2SC1815 (GR)	AF	NPN Si-E	60	5	150	400	125	0.1 max.	60	200 ~ 400	6	2	0.25 max.	100	10	80 min.	10	1*	3 max.		TOSHIBA
2SC2655 (Y)	AF, Power amp.	NPN Si-E	50	5	2A	900	150	1.0 max.	50	120 ~ 240	2	0.5A	0.5 max.	1A	50	100	2	0.5A*	30		TOSHIBA
2SD880 (Y)	AF, Power amp.	NPN Si Td	60	7	3A	30W (Tc=25°C)	150	100 max.	60	100 ~ 200	5	0.5A	1 max.	3A	0.3A	3	5	0.5A	70		TOSHIBA

DIODES, LED'S

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (T_A = 25°C unless otherwise specified)									ELECTRICAL CHARACTERISTICS Typical Values: (T_A = 25°C unless otherwise specified)							MANUFACTURER
			Reverse Surge Voltage V_{Rsurge} (V)	Peak Reverse Voltage V_{RM} (V)	Reverse Voltage V_R (V)	Peak Forward Voltage V_{FM} (V)	Peak Forward Current I_{FM} (mA)	Average Rectified Current Io (mA)	Forward Surge Current $I_{F\,surge}$ (A)	Junction Temperature T_J (°C)	Total Power Dissipation P_D (mW)	Forward Current I_{Fmin} (mA)	Forward Current Test Condition V_F (V)	Forward Voltage V_{Fmax} (V)	Forward Voltage Test Condition I_F (mA)	Reverse Current I_{Rmax} (uA)	Reverse Current Test Condition V_R (V)	Others	
1N60	Detector	Ge-Pc		45			150	50	0.5	75		4	1	1	4	75			TOSHIBA
1SR35-100	Rectifier	Si-J	150	100				1A	30	175				1.1	1A	10	100		TOYO ELECTRONICS
SLP-1378	Lamp (red)	GaP			3			I_F=30			70			2.4	5	10	3	I_V = 1 mcd (I_F = 5 mA)	SANYO
SLP-2378	Lamp (green)	GaP			3			I_F=30			70			2.8	20	10	3	I_V = 1.5 mcd (I_F = 20 mA)	SANYO

ZENER DIODES

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (T_A = 25°C unless otherwise specified)			ELECTRICAL CHARACTERISTICS Typical Values: (T_A = 25°C unless otherwise specified)													MANUFACTURER
			Total Power Dissipation P_D (mW)	Zener Current I_Z (mA)	Junction Temperature T_J (°C)	Zener Voltage V_Z MIN (V)	Zener Voltage V_Z TYP (V)	Zener Voltage V_Z MAX (V)	Zener Voltage Test Conditions I_Z (mA)	Differential Resistance r_Z TYP (Ω)	Differential Resistance r_Z MAX (Ω)	Differential Resistance Test Conditions I_Z (mA)	Temperature Coefficient γ_Z TYP (%/°C)	Temperature Coefficient γ_Z MAX (%/°C)	Temperature Coefficient Test Conditions I_Z (mA)	Reverse Current I_Z MAX (μA)	Reverse Current Test Conditions V_R (V)	Others	
05Z13L	Regulator	Si-P	500	34	175	12.4		13.5		25	35		0.080	0.092	5	0.5	10		TOSHIBA

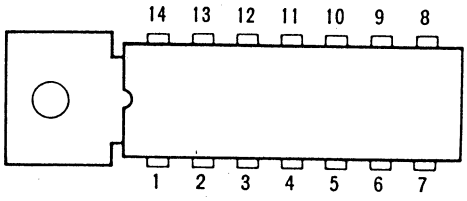
INTEGRATED CIRCUIT LA4170

- APPLICATION: DUAL HEADPHONE AMPLIFIER
- MANUFACTURER: SANYO

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

ITEM	SYMBOL	RATING	UNIT
Supply Voltage	Vcc	22	V
Supply Current	Icp	0.5	A
Power Dissipation	P_T	1050	mW
Operating Temperature	Topr	−20 ~ 70	°C
Storage Temperature	Tstg	−40 ~ 150	°C

TERMINAL GUIDE (TOP VIEW)



ELECTRICAL CHARACTERISTICS (Ta = 25°C, Vcc = 14V, R_L = 8Ω, f = 1 kHz, Rg = 600Ω)

ITEM	SYMBOL	CONDITION	RATING			UNIT
			MIN.	TYP.	MAX.	
Idling Current	Icco		6	8	15	mA
Voltage Gain	V_G	Vo = 77.5 mV	7	9	11	dB
Output Voltage	Vo	Vcc = 14V THD = 10%	0.58	0.68		V
Total Harmonic Distortion	THD	Vo = 0.1 V		0.5	1.0	%
Input Resistance	Ri	Vo = 0.2 V	20	30	40	kΩ
Output Noise Voltage	V_{NO}	Rg = 1 kΩ		6	18	μV
Channel Separation	CT	Rg = 1 kΩ	−50	−68		dB
Gain Difference					1.0	dB

BLOCK DIAGRAM